ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE **February 2000**
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0203758A Digitization**	PROJECT **D374**

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D374 Horizontal Battlefield Digitization	40056	29941	29671	29202	28584	32134	33130	Continuing	Continuing

A. Mission Description and Budget Item Justification: Battlefield Digitization is a strategy that allows warfighters, from the individual soldier and platform to echelons above corps, to share critical situational awareness (SA) and command and control information. It applies digital information technologies to acquire, exchange, and employ data throughout the battlespace, providing a clear and accurate common relevant picture of the battlespace for leaders at all levels. This timely sharing of information significantly improves the ability of commanders and leaders to quickly make decisions, synchronize forces and fires, and increase the operational tempo. Digitization is a means of realizing a fully integrated command and control capability to the platoon level, including interoperability links with joint and multinational forces. The major FY01 efforts included in the program element are: 1) The horizontal battlefield operating integration office (Army Digitization Office), responsible for the integration and synchronization of the Army's digitization efforts; coordination of digitization efforts between joint and multi-national forces; and synchronization of combat material and training efforts to develop and deploy Army XXI information technologies. 2) System engineering and integration of physical interfaces and logical mechanisms between and across multiple battlefield operating systems to provide improved capability to operate in the common battlefield picture/SA and common operating environment (COE) dimensions. This will provide enhanced synchronization of maneuver, direct/indirect fires, intelligence and targeting, and reduced fratricide. The goal of Horizontal Battlefield Digitization is to integrate modern information technology into the Army of the 21st Century.

FY 1999 Accomplishments:

- 4849   Data engineering evaluation and analysis testing, experimentation and interrelated simulation of hardware/software
- 4029   System/Platform Integration of heavy/light forces; synchronization assessments, battlefield digitization impact studies and system of systems issue resolutions.
- 2300   Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts. Specific tasks included: database development, operation system architecture development, and Multilateral Interoperability (MIP) Phase I testing and Phase I demonstrations.
- 1417   Analysis (including modeling/simulation) to predict overall digitized system of systems performance.
- 17320   Continued software/hardware integration, prototype development and commencement of testing of FBCB2/Embedded Battle Command (EBC) on Abrams tanks and Bradley fighting vehicles.
- 1118   Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security and physical layout.
- 1138   Integration tools, plans, specifications and other training, logistics interface and configuration management products for the 66 TRADOC identified systems.
- 4135   Evaluated emerging interfaces to ensure interoperability across all functional areas including: 1) Studied porting of EBC for aviation, SSAT for Beta version and ADA bindings solutions for the Aviation communications requirements for full tactical internet (TI) connectivity/mobility and support of

Project D374   *Page 1 of 7 Pages*   Exhibit R-2 (PE 0203758A)

Item 160

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374

FY 1999 Accomplishments: (continued)

integration into each platform; Simulations Testing Operations Rehearsal Model (STORM) stimulator interoperability; TOC server integration; and aviation integration into the TI. 2) Continued work on the electronic interface security issue and the TI interface. 3) Refined the software architecture for the TOC server/BOOT Control/Command and Control Register; supported system integration and interoperability analysis and design/demonstration of capabilities of software modules and the operational architecture. 4) Performed systems engineering analysis of the Joint Tactical Radio System (JTRS) evolving architecture to evaluate its capability to satisfy Army Aviation near term requirements for TI connectivity.

- 1875 Executed Digital Intelligence Situation Mapboard effort.
- 1875 Executed first year University XXI projects including; analysis, research and development of training and simulation tools, the design of prototypes and the investigation of unique/new technologies which will directly support digitized battle staff training and reduce training overhead costs.

Total   40056

FY 2000 Planned Program:

- 5011 Data engineering evaluation and analysis testing, experimentation and interrelated simulation of hardware/software
- 4150 System/Platform Integration of heavy/light forces; synchronization and integration of fielding plans, assessments, and resources; battlefield digitization impact studies, and system of systems issue resolutions
- 3040 Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts; specific tasks to include: database development, operational system architecture, and Multilateral Interoperability Program (MIP) Phase I testing and the International Remote Command Post Exercise (CPX).
- 1723 Analysis (including modeling/simulation) to predict overall system of systems performance.
- 2955 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.
- 3637 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems.
- 6289 Evaluate emerging interfaces to ensure interoperability across all functional areas including: improved locating, tracking, and management of transportation assets; support tactical internet and electronic interfaces required for logistic functions; solution development for Aviation communications requirements for full tactical internet connectivity/mobility, and support system integration of interoperability analysis, design, and demonstration of capabilities to minimize platform modifications to achieve maximum benefits of open architecture.
- 2375 Apply university academic and research resources to Army modeling, simulation and training to support the Army digitization strategy.
- 761 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total   29941

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE **February 2000**

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	**0203758A Digitization**	**D374**

FY 2001 Planned Program:

- 5083 Data engineering evaluation and analysis testing, experimentation and interrelated simulation of hardware/software.
- 4300 System/Platform Integration of heavy/light forces, synchronization assessments, battlefield digitization impact studies and system of systems issue resolution.
- 2355 Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts; specific tasks to include: database development, operational system architecture, and Multilateral Interoperability Program (MIP) Phase I testing and the International Remote Command Post Exercise (CPX).
- 1916 Analysis (including modeling/simulation) to predict overall system of systems performance.
- 2914 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.
- 5285 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems. (e.g. BFIST, Linebacker, BCIS, Aviation Platforms, Ground Combat Platforms)
- 6818 Evaluate emerging interfaces to ensure interoperability across all functional areas including: support tactical internet and electronic interfaces required for additional logistic functions; additional solution development for Aviation communications requirements for full tactical internet connectivity/mobility, and support system integration of interoperability analysis, design, and demonstration of capabilities to minimize platform modifications to achieve maximum benefits of open architecture.
- 1000 Apply university academic and research resources to Army modeling, simulation and training to support Army digitization strategy based upon direction provided by Army.

Total   29671

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	46240	28180	26830
Appropriated Value	47007	30180	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-767		
b. SBIR / STTR	-1881		
c. Omnibus or Other Above Threshold Reductions		-117	
d. Below Threshold Reprogramming	-4013		
e. Rescissions	-290	-122	
Adjustments to Budget Years Since FY 2000/2001 PB			+2841
Current Budget Submit (FY 2001 PB)	40056	29941	29671

Change Summary Explanation: Funding – FY 2001: Funds increased for system integration/interoperability in support of the First Digital Corps (FDC) and the remainder of the force.

Project D374	*Page 3 of 7 Pages*	Exhibit R-2 (PE 0203758A)

Item 160

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000

BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374

C. Other Program Funding Summary: Not applicable

D. Acquisition Strategy: To validate/demonstrate concepts and requirements, near term efforts were focused on developing a seamless battlefield software architecture and digitized appliqué hardware systems supporting experimentation to include: evaluation of the horizontal battlefield digitization resources of systems, acquisition, integration, and testing of digital capability across multiple command and control, communications, sensor and weapons platforms. The result will be an integrated digital capability designed to meet the near-term requirements of the First Digitized Division by end of FY00 and First Digitized Corps by the end of FY04. Also, it supports the Army's role in joint and multi-national digitization programs; coordinates/manages security, vulnerability and "Red Teaming" functions; and manages Manpower and Personnel Integration (MANPRINT), modeling and simulations, and analysis.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Army Tactical Cmd & Ctrl Info Sys (ATCCS) National Tests	1Q,4Q						
ATCCIS International Test	1Q,4Q						
ATCCIS Evaluation Cycles	2Q,3Q	1Q					
US/UK Lab Interop Demo	4Q						
Develop ATCCIS International Stds		2Q					
Develop International C2 Op Arch.							
- MIP Phase I Testing	2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q				
- MIP Phase I Demos	1Q,2Q	1Q,2Q	1Q	1Q,2Q,3Q,4Q			
Develop International (ABCS) Gateway (QIP)	1Q						
Tactical Personal Communications	4Q						
Corps Warfighter Exercises	1Q	2Q		2Q,3Q	2Q,3Q	2Q,3Q	
- Operational Readiness Eval.	2Q,3Q,4Q						
Integrate, test FBCB2 in Abrams tanks and Bradley fighting vehicles	3Q,4Q	1Q	1Q				
- FDD Hardware contract award		2Q					
- Equip First Digitized Division		4Q					
- Limited User Test/ Force Development Test & Evaluation		2Q,3Q	2Q,3Q				
- Initial Operation Test & Evaluation				1Q			
- Initial Operational Capability			1Q				
- EBC Follow-on Tests				3Q			
Evaluate electronic interface to tactical internet and to C2 systems.		1Q,3Q,4Q					

Project D374	*Page 4 of 7 Pages*	Exhibit R-2 (PE 0203758A)

Item 160

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)				DATE February 2000		
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0203758A Digitization			PROJECT D374

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Conduct analysis to support system design, experimentation and implementation		2Q,3Q					
Light Force Digitization				1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q
First Digitized Corps		1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	

ARMY RDT&E COST ANALYSIS (R-3)		DATE February 2000
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0203758A Digitization**	PROJECT **D374**

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. System Integration	MIPR/PWD	Various	47230	12012	Various	13200	Various	16300	Various		88742	
b. International Digitization	MIPR/PWD	Various	12800	2307	Various	3040	Various	2355	Various		20502	
c. Technical Analysis	MIPR/PWD	MITRE, Pentagon, McLean, VA	4400	657	Oct 98	1091	Oct 99	1091	Oct 00		7239	
d. Tank/Brad	CPFF	GDLS Warren, MI/ UDLP San Jose, CA	73720	17320	IQ						91040	
e. Other Govt. Agencies	MIPR/PWD	Various	22832	1302		3109	Various	2380	Various		29623	
Subtotal Product Development:			160982	33598		20440		22126			237146	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
f. ADO Office Operations	N/A	Pentagon	6504	1876		1904		1200			11484	
h. Digitization Planning, Internet and graphics support	PWD	Signal Corp. Pentagon and Arlington, VA	4200	980	Oct 98	1357	Oct 99	1700	Oct 00		8237	
i. Info Ops, System Eng. Integration & Ops Spt.	PWD	Quantum Res International Pentagon, Ft. Monroe, VA & Ft. Hood, TX	5295	1193	Oct 98	2392	Oct 99	2780	Oct 00		11660	
j. Various	MIPR/PWD	Pentagon	720	180	Oct 98	316	Various	307	Various		1523	
k. SBIR/STTR						761					761	
Subtotal Support Costs:			16719	4229		6730		5987			33665	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Other Govt. Agencies	MIPR/PWD	Various	3560	354		596	Various	558	Various		5068	
b. University XXI Initiatives	MIPR/PWD	Univ. of Texas and Texas A&M		1875		2175	Feb 00	1000	Oct 00		5050	
Subtotal Test and Evaluation:			3560	2229		2771		1558			10118	

Project D374

Page 6 of 7 Pages

Exhibit R-3 (PE 0203758A)

Item 160

ARMY RDT&E COST ANALYSIS (R-3)	DATE February 2000

BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374

IV. Management Services: Not applicable

			Total PYs Cost	FY 1999 Cost		FY 2000 Cost		FY 2001 Cost			Total Cost	
Project Total Cost:			181261	40056		29941		29671			280929	